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27° west of south." He believes that the ice-marks were made by glaciers rather than by floating ice (though there are still a few lingering supporters of the iceberg theory), thus substantiating, by the results of two summers' travels in Newfoundland, the observations made by the undersigned during two summers' travels along the coast of Labrador. — A. S. PACKARD, JR.

GEOGRAPHY AND EXPLORATION.

EXTRACTS FROM STANLEY'S LAST LETTERS FROM CENTRAL AFRICA. — From one of the many spurs of Kabuga we obtained a passing glimpse of the king of mountains, Gambaragara, which attains an altitude of between thirteen thousand and fifteen thousand feet above the ocean. Snow is frequently seen, though not perpetual. On its summits dwell the chief medicine men of Kabba Rega, a people of European complexion.

Some half-dozen of these people I have seen, and at sight of them I was reminded of what Mukamba, king of Uzige, told Livingstone and myself respecting white people who live far north of his country. They are a handsome race, and some of the women are singularly beautiful. Their hair is kinky, but inclined to brown in color. Their features are regular, lips thin, but their noses, though well-shaped, are somewhat thick at the point. Several of their descendants are scattered throughout Unyoro, Ankori, and Ruanda, and the royal family of the latter powerful country are distinguished, I am told, by their pale complexions. The queen of Sasua Islands, in the Victoria Nyanza, is a descendant of this tribe.

Whence came this singular people I have had no means of ascertaining except from the Waganda, who say that the first king of Unyoro gave them the land around the base of Gambaragara Mountain, wherein through many vicissitudes they have continued to reside for centuries. On the approach of an invading host they retreat to the summit of the mountain, the intense cold of which defies the most determined of their enemies.

The geographical knowledge we have been able to acquire by our forcible push to the Albert Nyanza is considerable. The lay of the plateau separating the great reservoirs of the Nile, the Victoria and Albert Nyanzas, the structure of the mountains and ridges, and the course of the water-sheds, and the course of the rivers Katonga and Rusango have been revealed. The great mountain Gambaragara and its singular people have been discovered, besides a portion of a gulf of the Albert, which I have taken the liberty to call, in honor of her Royal Highness Princess Beatrice, Beatrice Gulf.

This gulf, almost a lake by itself, is formed by the promontory of Usongora, which runs southwest some thirty miles from a point ten geographical miles north of Unyampaka. The eastern coast of the gulf is

formed by the countries of Irangara, Unyampaka, Buhuju, and Mpororo, which coast line runs a nearly south-southwest course. Between Mpororo and Usongora extend the islands of the maritime state of Utumbi. West of Usongora is Ukonju, on the western coast of Lake Albert, reputed to be peopled by cannibals. North of Ukonju is the great country of Ulegga.

Coming to the eastern coast of Lake Albert we have Ruanda running from Mpororo on the east to Ukonju on the west, occupying the whole of the south and southeast coast of Lake Albert. North of Unyampaka, on the east side, is Irangara, and north of Irangara the district of Toro. Unyoro occupies the whole of the east side from the Murchison Falls of the Victoria Nile to Mpororo, for Unyampaka, Toro, Buhuju, and Irangara are merely districts of Unyoro. The great promontory of Usongora, which half shuts in Beatrice Gulf, is tributary to Kabba Rega, though governed by Nyika, king of Gambaragara.

Usongora is the great salt field whence all the surrounding countries obtain their salt. It is, from all accounts, a very land of wonders, but the traveler desirous of exploring it should have a thousand Sniders to protect him, for the natives, like those of Ankori, care for nothing but milk and goatskins. Among the wonders credited to it are a mountain emitting "fire and stones," a salt lake of considerable extent, several hills of rock salt, a large plain encrusted thickly with salt and alkali, a breed of very large dogs of extraordinary ferocity, and a race of such long-legged natives that ordinary mortals regard them with surprise and awe.

After circumnavigating Lake Windermere we entered the Kagera River, and almost immediately it flashed on my mind that I had made another grand discovery, — that I had discovered, in fact, the true parent of the Victoria Nile.

If you glance at Speke's map you will perceive that he calls this river the Kitangule River, and that he has two tributaries running to it called respectively the Luchuro and the Ingezi. Speke, so wonderfully correct, with a mind which grasped geographical knowledge with great acuteness and arranged the details with clever precision and accuracy, is seriously in error in calling this noble river Kitangule. Neither Waganda nor Wanyamba know it by that name, but they all know the Kagera River, which flows near Kitangule. From its mouth to Urundi it is known by the natives on both banks as the Kagera River. The Luchuro, or rather Lukaro, means "higher up," but is no name of any river. Of the Ingezi I shall have occasion to speak further on.

While exploring the Victoria Lake I ascended a few miles up the Kagera, and was then struck with its great volume and depth, so much so as to rank it as the principal affluent of the Victoria Lake. But in coming south, and crossing it at Kitangule, I sounded it and found fourteen fathoms of water, or eighty-four feet deep, and one hundred and

twenty yards wide. This fact, added to the determined opinion of the natives that the Kagera was an arm of the Albert Nyanza, caused me to think the river worth exploring. I knew, as all know who know anything of African geography, that the Kagera could not be an affluent of Lake Albert, but their repeated statements to that effect caused me to suspect that such a great body of water could not be created by the drainage of Ruanda and Karagwe; that it ought to have its source much farther, or from some lake situate between lakes Albert and Tanganyika.

When I explored Lake Windermere I discovered, by sounding, that it had an average depth of forty feet, and that it was fed and drained by the Kagera. On entering the Kagera I stated that it flashed on my mind that the Kagera was the real parent of the Victoria Nile; by sounding I found fifty-two feet of water in a river fifty yards wide. I proceeded on my voyage three days up the river, and came to another lake about nine miles long and a mile in width, situate on the right hand of the stream. At the southern end of the lake, and after working our way through two miles of papyrus, we came to the island of Unyamubi, a mile and a half in length.

Ascending the highest point on the island the secret of the Ingezi or Kagera was revealed. Standing in the middle of the island I perceived it was about three miles from the coast of Karagwe and three miles from the coast of Kishakka, west, so that the width of the Ingezi at this point was about six miles, and north it stretched away broader, and beyond the horizon green papyri mixed with broad gray gleams of water. I discovered, after further exploration, that the expanses of papyri floated over a depth of from nine to fourteen feet of water; that the papyri, in fact, covered a large portion of a long, shallow lake; that the river, though apparently a mere swift-flowing body of water, confined apparently within proper banks by dense, tall fields of papyri, was a mere current, and that underneath the papyri it supplied a lake, varying from five to fourteen miles in width and about eighty geographical miles in length.

Descending the Kagera again, some five miles from Unyamubi the boat entered a large lake on the left side, which, when explored, proved to be thirteen geographical miles in length by eight in breadth.

From its extreme western side to the mainland of Karagwe east was fourteen miles, eight of which was clear, open water; the other six were covered by floating fields of papyri, large masses or islands of which drift to and fro daily. By following this lake to its southern extremity I penetrated between Ruanda and Kishakka. I attempted to land in Ruanda, but was driven back to the boat by war-cries, which the natives sounded shrill and loud.

Throughout the entire length (eighty miles) the Kagera maintains almost the same volume and almost the same width, discharging its sur-

plus waters to the right and to the left as it flows on, feeding, by means of the underground channels, what might be called by an observer on land seventeen separate lakes, but which are in reality one lake, connected together underneath the fields of papyrus, and by lagoon-like channels meandering tortuously enough between detached fields of the most prolific reed. The open expanses of water are called by the natives so many "rwerus" or lakes; the lagoons connecting them and the reed-covered water are known by the name of "Ingezi." What Speke has styled Lake Windermere is one of these rwerus, and is nine miles in extreme length and from one to three miles in width. By boiling point I ascertained it to be at an altitude of 3760 feet above the ocean and about 320 feet above Lake Victoria. The extreme north point of this singular lake is north by east from Uhimba south, its extreme southern point. Karagwe occupies the whole of its eastern side. Southwest it is bounded by Kishakka, west by Muvuri, in Ruanda, northwest by Mpororo, and northeast by Ankori. At the point where Ankori faces Karagwe, the lake contracts, becomes a tumultuous, noisy river, creates whirlpools, and dashes itself madly into foam and spray against opposing rocks, and finally rolls over a wall of rock ten or twelve feet deep with a tremendous uproar, for which the natives call it Morongo, or the Noisy Falls.

Since I left Zanzibar I have traveled 720 miles by land and 1004 miles (by computation) by water. This in six months is good work. Over one hundred positions settled by astronomical observations, for you must know that from the very day I got my commission I strenuously prepared to fit myself for geographical work, in order that I might be able to complete Speke, Burton, Baker, and Livingstone's labors, which they left undone. Now Speke's work is done. What he commenced I have finished. I do not know whether you comprehend the drift of this expedition, but I will explain.

You must know that Speke, in 1858, came to the southwest end of Lake Victoria, and from a hill near the lake he discovered the vast body of fresh water. Having gazed his fill he returned to England and was commissioned to find its outlet. In 1861 and 1862 he marched from Zanzibar to Ugawa, when he saw the lake again. At the Ripon Falls he saw the lake discharge itself into the Victoria Nile, and went home again, imagining that he had done his work. If his work was merely to find the outlet of Lake Victoria he completed his task, but if his task was to discover the sources of the Nile he had but begun his work. He went away without discovering the feeders of Lake Victoria, which in reality are the Nile's sources; extreme southern sources, I mean. Then Baker came to Central Africa and discovered Lake Albert. He voyaged sixty miles on the lake, and he ran home also without knowing anything of the lake's sources. Burton went to Taraganika, saw it, and returned home without knowing its extent, outlet, or affluents. Living-

stone came next to the chain of lakes west of Taraganika, and died nobly in harness. Well, we are sent to complete what these several travelers have begun. While they are content with having discovered lakes, I must be content with exploring these lakes and discovering their sources, and unraveling the complications of geographers at home. It is a mighty work, but a fourth of that work is already done.

SCIENTIFIC NEWS.

— The Eucalyptus or Australian gum-tree continues to be largely planted in California not only for ornamental but also for economic purposes. A large forest of these trees has been planted by a company and is situated on the line of railroad between Los Angeles and Anaheim. A recent statement of the company's affairs shows that it owns two hundred acres of fine land, on which are houses and other improvements. About one hundred and forty acres have been set out in Eucalyptus, containing about eighty thousand trees. Of these some thirty thousand are from nine to fifteen feet high. The total cost up to January 1st, including purchase of land, houses, teams, etc., is \$12,523. The estimated expense for the first year, prior to incorporating the company, was \$12,750, the actual expense being less than the estimate. The present value of the property is from \$40,000 to \$60,000, and this at a total cost of \$12,523. The remaining sixty acres will be set out by the 5th of May, after which time the expenses will be but little. At the start the estimated total cost for four years was \$1,000 to \$20,000 or 20 per cent. of the capital, which will be reduced, according to later estimates, to \$16,000 or \$18,000, and it is believed that at the end of four years the property will be worth not less than \$100,000. Only a few shares have changed hands during the year, and these at an advance equal to three per cent. The plantation is owned by seventeen persons. The young trees (*Eucalyptus*) have been produced in greater numbers in California the past season than ever before, and are sold by the nurserymen at much lower prices than previously, with an increasing demand.

— An essay by Dr. C. F. Lütken on the fresh-water fishes of Brazil, including some interesting new genera and species, and illustrated with a number of exquisite plates and numerous fine wood-cuts, appears in the memoirs of the Royal Academy of Copenhagen. The work is based on collections made some years ago by Professor J. Reinhardt. The memoir will prove of a good deal of interest to American ichthyologists.

— The veteran microscopist and naturalist, C. G. Ehrenberg, died in July last, aged eighty-two. His intellectual activity remained undiminished almost to the last, and though he failed to interpret aright the structure of the Infusoria, his zoölogical and micro-geological works were still valuable and original.

— Messrs. Macmillan & Co. announce as to be published in October